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## Yet Another Rapid Readout - For ATLAS Inner Tracker during HL-LHC

*Thursday, November 9, 2023 5:05 PM (15 minutes)*

The Inner Pixel Tracker (ITkPix) is the most important subdetector in ATLAS for tracking and vertexing of the charged particles produced in the collisions. Being closest to the beam pipe, it also has the highest flux of particles traversing through the material per unit area at any given time. During HL-LHC, the number of particle interactions in every bunch crossing will increase manifolds. Hence, there will be a need for an efficient readout software which can cope with receiving hit data from the Front-Ends (FEs) and to support FE-specific calibrations at MHz frequencies. At LBNL, we have designed such a software, known as Yet Another Rapid Readout (YARR), which is in fact a very flexible implementation for various FE types and supports various hardware platforms where an FPGA is interfaced via a PCIe link. With YARR, we can perform readout of a single chip for smaller scale developments to actually reading out multiple modules to simulate a more realistic detector-like scenario. We have a test-stand with the ITkPix v1.1 modules with the FELIX hardware, where we are carrying out testing and developments for the ATLAS community, which will be later used for actual operations such as the system tests and data-taking.

### Early Career

Yes

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